Predicting customer churn in telecommunication companies

Introduction

The telecom industry in Nigeria is facing fierce competition such that customer retention is becoming a real challenge. Telecommunication companies do not want their customers to churn them for other service providers. The telecom industry is flooded with more service providers entering the market and competing for larger shares of the market. Thus addressing customer churn is fast becoming a necessity.

Customer satisfaction and customer loyalty has always been important factors in modern retailing (Juhl, Kristensen & Ostergaard, 2002) and could be measured by customer churn. Customer churn has always been a problem in the retailing sector e.g. retail banking and Tele-communications as must retail business models depend on long-term relationships with customers in order to be profitable. So managing customer churn should be a top priority in service industries like retail banking and telecommunications (Sweeney & Swait, 2008) as customer retention is one of the best strategies to increase the customers’ and company’s market share.

Impact of customer churn

Few studies have shown the impact of customer churn, for example a study conducted by Kisioglu & Topcu (2011) showed that a 1% increase in customer retention strategies may decrease the churn rate by up to 5%. Further, customer retention is proved to be 5-6 times cheaper than acquiring new customers. For example, according to Hassouna, Tarhini, Elyas & Trab (2015); improving customer retention contributed in reducing churn rate from 20% to 10% annually which saved about GBP 25,000,000 for the mobile operator orange. In its research for Bain and Company, Frederick Reicheld (Frederick Reichheld, 1993) stated that the cost of acquiring a new customer could be higher than that of retaining a customer by as much as 700%, and that increasing customer retention rates by a mere 5% could increase profits by 25% to 95%.

Some of the factors that influence customer attrition from the existing service provider could be customer satisfaction, superior technology, cost of change and advertising etc. Indeed, due to saturated markets, focusing on Customer Relationship Management (CRM) to improve customer satisfaction, investing in research and development and spending advertising dollars in order to retain existing customer base is not optional anymore, but an absolute necessity for competitive survival. However these efforts cannot be adopted all willy-nilly as in the past but must be strategically adopted; and one way to strategically affect customer retention is Customer Churn prediction.

What is Customer churn

Customer churn refers to “a customer leaving a service provider” (Wei & Chui, 2002). Customer churn is defined as the affinity of customer to finish the contact with a company. It is otherwise also called customer attrition (Hejazinia & Kazemi, 2014; Yang & Chiu, 2006). In simple terms, Churn is when a customer stops doing business or ends a relationship with a company. Churn rate is the rate at which customers are leaving a company during some period. If churn rate is higher than certain threshold value, it will have substantial and subtle effects (Malik, 2020) on the profitability of any business.

Hejazinia & Kazemi (2014) mentioned different types of customer churns as (i) Contractual Churn: When a customer is under a contract for a service and decides to cancel the service e.g. Cable TV, Software-as-a-Service (ii) Non-Contractual Churn: When a customer is not under a contract for a service and decides to cancel the service. E.g. Customer loyalty in retail stores (iii) Voluntary Churn: When a user voluntarily cancels a service e.g. Cellular connection. (iv) Involuntary Churn: When a churn occurs without any request of the customer e.g. Credit card expiration.

Customer churn is one of the major concerns of large companies. Hence it is important to predict potential customer churn. When churn prediction model is developed, it can assist telecom companies to predict customers who are more likely to churn enabling them tak important and necessary actions required to reduce customer churn (Ahmad, Jafar & Aljoumaa, 2019).

Customer Churn prediction

Churn prediction is the activity of trying to predict the phenomena of loss of customers using data related to their customers’ behavior. Data-driven decision making is way for businesses to make sure their next move will benefit both them and their customers. Almost every company, especially in the Tech ecosystem has now put into place a tracking process, to gather data related to their customers’ behavior. The data being tracked varies given the specific business model of each company and the problem they aim to address. By analyzing how, when and why customers behave a certain way, it is possible to predict their next steps and have time to work on fixing issues beforehand.

Though many approaches are followed to address the problem of predicting the customer churn in telecom companies, however machine learning (Vafeiadis, Diamantaras, Sarigiannidis & Chatzisavvas, 2015) and data mining approach are the most recently adopted approaches that focuses on comparing several strategies to predict churn.

The prediction of churn is generally done by studying consumer behavior or by observing individual behavior that indicates a risk of attrition. Such behaviors include; variations in consumption or usage behavior, change to inactive client status or a drop in service usage, the formulation of a claim (number, frequency and types of claims) and or an increase in consumption leading to a sharp rise in the bill

Our Approach

Python programming and its libraries implemented using machine learning techniques could be adopted to predict churn for the given data set which could have the following attributes: Gender, Partner, Dependents, Phone Service, Multiple Lines, Internet Service, Online Security, Online Backup, Device protection, Tech Support, Streaming TV, Streaming Movies, Contract, Paperless Billing, Payment method, Churn etc.

Machine learning algorithms such as Decision Tree, Random Forest, Gradient Boosted Machine Tree “GBM” and Extreme Gradient Boosting “XGBOOST” (Ahmad, Jafar & Alijoumaa, 2019) are used to predicting customer churn. Machine learning algorithms such as decision tree algorithms process categorical data work better with numerical data.

Process of churn prediction using machine learning techniques

Data pre-processing

The greatest improvements are usually achieved with a proper data cleaning process. To properly prepare the data for machine learning modeling, you need to **Remove outliers, Remove multicollinearity,** transform all the non-numeric and categorical data to numeric, Splitting the dataset into the Training set and Test set

Feature scaling

Feature values can be comparably different by orders of magnitude. For instance, loan size is in the tens of thousands ($50,000), while “number of months late” is in single digits (0, 1, 2, …). Features of different scales convert slower (or not at all) with gradient descent.

Training the classification model on the Training set

Typically, when you’re building a model, you split your labeled dataset into training and testing sets (though, sometimes, your testing set may be unlabeled). And, of course, you train your algorithm on the former and validate its performance on the latter.

Evaluate the model using confusion matrix

Once the accuracy level is acceptable, accuracy and confusion matrix are used as parameters to judge how accurately this model is behaving. If the value of accuracy is high, it suggests that the model is a better fit. Similarly confusion matrix shows a matrix of true positive and true negative values as well as false positive and false negative values. If there is higher percentage of true values as compared to false values it indicates that the model is a better model. What happens when your validation set doesn’t give you the results you’re looking for? You’ll need to update your weights, drop or add labels, try different approaches, and retrain your model.

In addition it is best practice to training a couple an classification models using the data and choosing the classification model with the best accuracy.

Conclusion

Presently telecom market is facing severe competition. Customer churn prediction has become an important issue of customer relationship management to retain valuable customers. Therefore by performing this Customer Churn prediction research; the key factors affecting churn would be well understood, We would know who is at risk and Engage and educate them and We can efficiently target the right audience

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